

CLAIM AMENDMENTS:

Pending Claims

Claim 1 (Currently Amended): An apparatus comprising:

a pusher linearly movable without rotation from a retracted position to an extended position for inserting a slider onto a first section of a zipper comprising mutually interlockable first and second zipper strips;

first and second guides disposed on opposite sides of a second section of said zipper;

first and second grippers respectively disposed on opposite sides of a third section of said zipper disposed between said first and second sections, each of said first and second grippers being linearly movable without rotation between respective extended and retracted positions to grip said zipper when said grippers are in said extended positions and to not grip said zipper when said grippers are not in said extended positions;

third and fourth grippers respectively disposed on opposite sides of a fourth section of said zipper, said first ~~sections~~ section being disposed between said third and fourth sections, each of said third and fourth grippers being linearly movable without rotation between respective extended and retracted positions to grip said zipper when said grippers are in said extended positions and to not grip said zipper when said grippers are not in said extended positions; and

a splitter plate disposed between said first and second zipper strips along said second and third sections.

Claim 2 (Original): The apparatus as recited in claim 1, further comprising a channel for said pusher, said channel comprising first and second sidewalls, said first and second sidewalls of said pusher channel being mutually parallel, wherein said first and third grippers have interior surfaces generally coplanar with said first channel sidewall, and said second and fourth grippers have interior surfaces generally coplanar with said second channel sidewall.

Claim 3 (Original): The apparatus as recited in claim 1, wherein said splitter plate comprises a first groove facing said first guide and a second groove facing said second guide, said first and second grooves being aligned with a machine direction, said first zipper strip along said second and third sections of said zipper being seated in said first groove, and said second zipper strip along said second and third sections of said zipper being seated in said second groove.

Claim 4 (Original): The apparatus as recited in claim 1, wherein each of said first through fourth grippers comprises a textured end face that contacts said zipper when said first through fourth grippers are in their respective extended positions.

Claim 5 (Original): The apparatus as recited in claim 4, wherein said textured end faces of said first and second grippers each comprise a respective plurality of mutually parallel ridges aligned with a cross direction.

Claim 6 (Original): The apparatus as recited in claim 4, wherein said textured end faces of said third and fourth grippers each comprise a respective plurality of mutually parallel ridges aligned with a machine direction.

Claim 7 (Original): The apparatus as recited in claim 1, wherein said first and third grippers are fixed relative to each other and move in unison, and said second and fourth grippers are fixed relative to each other and move in unison.

Claim 8 (Currently Amended): The apparatus as recited in claim ~~[[1,]]~~ 7, wherein each of said first through fourth grippers comprises a respective end face that contacts said zipper when said first through fourth grippers are in their respective extended positions, said end faces of said first and second grippers being separated by a first distance and said end faces of said third and fourth grippers being separated by a second distance less than said first distance when said first through fourth grippers are in their respective extended positions.

Claim 9 (Currently Amended): The apparatus as recited in claim ~~1, further comprising a first cylinder for moving said first and third grippers, a second cylinder for moving said second and fourth grippers, and a third cylinder for moving said pusher.~~ 38, wherein each of said first through third translation mechanisms comprises a respective air cylinder.

Claims 10 and 11 (Canceled).

Claim 12 (Currently Amended): The apparatus as recited in claim [[10,]] 38, further comprising means for advancing said zipper, wherein said programmed controller is programmed to control said advancing means and said first, second and third ~~cylinders~~ translation mechanisms so that said zipper is advanced while said grippers and said pusher are in their respective retracted positions.

Claim 13 (Original): The apparatus as recited in claim 1, wherein said pusher comprises a base that bears against a top wall of said slider, and a side wall that contacts a side wall of said slider, said side wall of said pusher having an angled interior surface that is not perpendicular to said base of said pusher.

Claim 14 (Currently Amended): A slider insertion machine comprising:

a pusher linearly movable without rotation from a retracted position to an extended position for inserting a slider into a predetermined volume of space and onto a first section of a zipper that spans said predetermined volume of space in a machine direction, said zipper comprising first and second zipper strips; and

first and second clamps respectively disposed on opposite sides of said zipper, each of said first and second clamps being linearly movable without rotation between respective extended and retracted positions to clamp second and third sections of said zipper ~~on opposite sides of said predetermined volume of space~~ when said clamps are in said extended positions and to not clamp said zipper when said

clamps are not in said extended positions; and

a plate comprising a first portion disposed between said first and second zipper strips in said second section of said zipper,

wherein said first clamp comprises first and second arms connected by a first cross member and having respective end faces, said second clamp comprises third and fourth arms connected by a second cross member and having respective end faces that oppose the respective end faces of said first and second arms, said distal portion of said plate is disposed between said opposing end faces of said first and third arms, and at least a portion of said pusher is disposed between said first and second cross members in a transverse direction when said pusher is in its extended position.

Claim 15 (Original): The machine as recited in claim 14, wherein each of said first and second clamps is generally U-shaped and straddles a respective portion of said predetermined volume of space when said clamps are in said extended positions.

Claim 16 (Canceled).

Claim 17 (Currently Amended): The machine as recited in claim ~~[[16,]]~~ 14, wherein said plate has first and second grooves on opposing sides thereof and aligned with ~~[[a]]~~ said machine direction, a first portion of said first groove facing said end face of said first arm and a first portion of said second groove facing said end face of said third arm.

Claim 18 (Currently Amended): The machine as recited in claim 17, further comprising first and second guides disposed on opposite sides of a ~~proximal~~ second portion of said plate, a second portion of said first groove facing said first guide and a second portion of said second groove facing said second guide.

Claim 19 (Original): The machine as recited in claim 16, wherein said end faces of said first through fourth arms have textured surfaces.

Claim 20 (Original): The machine as recited in claim 19, wherein said textured end faces of said first and third grippers each comprise a respective plurality of mutually parallel ridges aligned with a cross direction.

Claim 21 (Original): The machine as recited in claim 19, wherein said textured end faces of said second and fourth grippers each comprise a respective plurality of mutually parallel ridges aligned with a machine direction.

Claim 22 (Original): The machine as recited in claim 16, wherein said first arm is longer than said second arm, and said third arm is longer than said fourth arm.

Claim 23 (Original): The machine as recited in claim 16, further comprising a first cylinder for moving said first clamp, a second cylinder for moving said second clamp, and a third cylinder for moving said pusher.

Claim 24 (Original): The machine as recited in claim 16, further comprising a channel for said pusher, said channel comprising first and second sidewalls, said first and second

sidewalls of said pusher channel being mutually parallel, wherein said first clamp has one interior surface generally coplanar with said first channel sidewall and another interior surface generally coplanar with said second channel sidewall, and said second clamp has one interior surface generally coplanar with said first channel sidewall and another interior surface generally coplanar with said second channel sidewall.

Claim 25 (Canceled).

Claim 26 (Currently Amended): The method as recited in claim [[25,]] 30, wherein step [[(a)]] (c) comprises advancing said section of said zipper material while a leading edge of a stationary splitter plate pries said first and second zipper strips apart.

Claim 27 (Currently Amended): The method as recited in claim 26, wherein steps [[(b)]] (d) through [[(d)]] (f) are performed during a dwell time after said advancement.

Claim 28 (Original): The method as recited in claim 27, further comprising the steps of releasing said first and second portions of said first and second zipper strips, and advancing said zipper material with said inserted slider thereon.

Claim 29 (Canceled).

Claim 30 (Currently Amended): A The method as recited in claim 29, of inserting a slider onto continuous zipper material, comprising the following steps:

(a) joining a first portion of film material to a first zipper strip along a length of zipper material;

(b) joining a second portion of film material to a second zipper strip along said length of zipper material;

(c) opening a section of said length of zipper material by disengaging said first and second zipper strips from each other;

(d) clamping a first portion of said first zipper strip against one side of a plate, said first portion of said first zipper strip forming part of said open section of said length of zipper material and being disposed on one side of a slider insertion zone;

(e) clamping a first portion of said second zipper strip against an opposite side of said plate, said first portion of said second zipper strip forming part of said open section of said length of zipper material and being disposed on said one side of said slider insertion zone;

(f) clamping a second portion of said first zipper strip against a second portion of said second zipper strip, said second portions of said first and second zipper strips forming a closed section of said length of zipper material and being disposed on an opposite side of said slider insertion zone; and

(g) inserting a slider having first and second side walls onto respective third portions of said first and second zipper strips, with a plow of said slider being disposed between respective third portions of said first and second zipper strips, wherein step (g) is performed after steps (a) through (f),



wherein said first and second zipper strips have substantially no flanges, said first and second portions of film material being joined to respective backs of said first and second zipper strips along said length section of said zipper material, said first portion of film material passing between said plow and said first side wall of said slider, and said second portion of film material passing between said plow and said second side wall of said slider.

Claims 31-37 (Canceled).

Claim 38 (New): The apparatus as recited in claim 1, further comprising:

a first translation mechanism for linearly moving both of said first and third grippers in either of first and second transverse directions without rotation;

a second translation mechanism for linearly moving both of said second and fourth grippers in either of first and second transverse directions without rotation;

a third translation mechanism for linearly moving said pusher in either of first and second elevational directions without rotation; and

a programmed controller that coordinates the operation of said first through third translation mechanisms so that said first and third grippers translate in one of said first and second transverse directions while said second and fourth grippers translate in the other of said first and second transverse directions, and so that said pusher inserts a slider onto said first section of said zipper while said

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first and second grippers grip said third section of said zipper and said third and fourth grippers grip said fourth section of said zipper.